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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/875,619	06/06/2001	Michael J. Dixon	27754/21720	7775

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EXAMINER	
LIANG, LEONARD S	

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/875,619	DIXON ET AL.	
	Examiner	Art Unit	
	Leonard S Liang	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 35-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 35-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/04/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. The applicant has elected Species I (Claims 1-7 and 35-37) with traverse. The applicant has proposed an alternative restriction/election requirement selecting a proposed Group I, which includes claim 1-13 and 35-37. However, upon examination of the claims, the examiner maintains the election of Species I (Claims 1-7, and 35-37). The reason for this is because claims 8-13 seem to represent a different species from claims 1-7. One of the key concepts in claims 1-7 is the concept of the resistance to flow of the inlet and outlet manifolds, and this concept is absent from claims 8-13. Furthermore, the applicant has argued that the previous election/restriction requirement was unclear, but did not specify how it was unclear. The restriction requirement is thus made final and claims 1-7 and 35-37 will herein be prosecuted.

Specification and Drawings

2. The lengthy specification and drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification and drawings.

Claim Objections

3. Claims 1 and 4 are objected to because of the following informalities: Claim 1 states "means for generating a fluid flow into said inlet manifold, though each chamber is said array..." This doesn't make sense. It will be construed that the claim should state "means for generating a

fluid flow into said fluid manifold, through each chamber in said array..." Claim 4 requires a similar correction. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

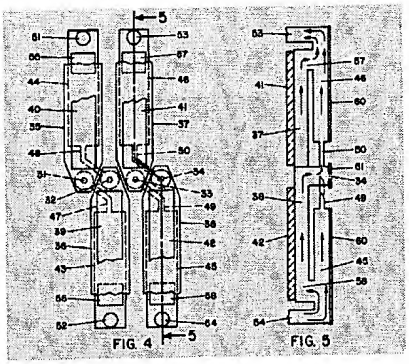
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6-7, 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoisington et al (US Pat 4835554) in view of Zhang (EP Pat 0810093 A2).

Hoisington et al discloses:

- {claims 1 and 4} Droplet deposition apparatus comprising: an array of fluid chambers, each chamber communicating with an orifice for droplet ejection, a common fluid inlet manifold and a common fluid outlet manifold (figure 4-5, reference 34, 53-54); and means for generating a fluid flow into the inlet manifold through each chamber in the array and into the outlet manifold, the fluid flow through each chamber being sufficient to prevent foreign bodies in the fluid from lodging in the orifice (figure 5, reference 53-54; column 5, lines 15-29; abstract); wherein each chamber is associated with means for effecting droplet ejection from the orifice simultaneously with the fluid flow through the chamber (column 4, line 59-column 5, line 68)
- {claims 6 and 36} the array of chambers is linear (figures 4-5)

- {claims 7 and 37} the array is angled to the horizontal and the inlet manifold extends parallel to the array, the properties of the inlet manifold varying in a direction lying parallel to the array in such a way as to substantially match the rate of pressure loss along the inlet manifold due to viscous losses in the inlet manifold to the rate of increase of static pressure along the inlet manifold due to gravity (figure 4-5; column 3-6)



Hoisington et al differs from the claimed invention in that it does not disclose:

- {claim 1} the resistance to flow of the inlet and outlet manifolds is chosen such that the static pressure at the orifice of any chamber in the array due to the flow varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array
- {claim 2} the inlet manifold has a resistance to flow less than that which would give rise to a variation in static pressure between the inlets to any two chambers in the array sufficient to produce significant differences in droplet ejection properties between the two chambers in the array

- {claim 3} the resistance to flow of the outlet manifold is chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array
- {claim 4} the resistance to flow of one of the inlet and outlet manifolds being chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array

Zhang discloses:

- {claim 1} the resistance to flow of the inlet and outlet manifolds is chosen such that the static pressure at the orifice of any chamber in the array due to the flow varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (column 9, line 46-column 11, line 58)
- {claim 2} the inlet manifold has a resistance to flow less than that which would give rise to a variation in static pressure between the inlets to any two chambers in the array sufficient to produce significant differences in droplet ejection properties between the two chambers in the array (column 9, line 46-column 11, line 58)
- {claim 3} the resistance to flow of the outlet manifold is chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant

differences in droplet ejection properties between the two chambers in the array (column 9, line 46-column 11, line 58)

- {claim 4} the resistance to flow of one of the inlet and outlet manifolds being chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (column 9, line 46-column 11, line 58)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Zhang into the invention of Hoisington et al. The motivation for the skilled artisan in doing so is to gain the benefit of providing uniform ink flow to the ink chambers, so that ink droplets can be jetted stably and effectively (column 9, line 46-column 12, line 8).

5. Claims 5 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoisington et al (US Pat 4835554) in view of Zhang (EP Pat 0810093 A2), as applied to claims 1 and 4 above, and further in view of Burr et al (EP Pat 0622210 A1).

Hoisington et al, as modified, teaches all limitations of the claimed invention except for the following: the cross-sectional area of at least one of the inlet and outlet manifolds is such that the pressure varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array.

Burr et al discloses, with respect to claims 5 and 35, the cross-sectional area of at least one of the inlet and outlet manifolds is such that the pressure varies between any two chambers

by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (abstract; page 11, lines 22-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Burr et al into the invention of modified Hoisington et al. The motivation for the skilled artisan in doing so is to gain the benefit of producing uniform flow rates and avoiding significant pressure loss in order to ensure effective ink ejection (abstract; page 11, lines 22-25).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rezanka (US Pat 5818485) discloses a thermal ink jet printing system with continuous ink circulation through a printhead.

Hagiwara et al (US Pat 6039442) discloses an electrostatic ink jet recording device having a stirring system.

Piatt et al (US Pat 4734711) discloses a pressure regulation system for multi-head ink jet printing apparatus.

Roy et al (US Pat 5087930) discloses a drop-on-demand ink jet print head.

Field et al (US Pat 5969736) discloses a passive pressure regulator for setting the pressure of a liquid to a predetermined pressure differential below a reference pressure.

Pennebaker, Jr. et al (US Pat 4011157) discloses ultrasonic removal of solid impurities from recirculating ink.

Takita (US Pat 5097275) discloses an ink jet printer head.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (703) 308-4896. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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LAMSON NGUYEN
PRIMARY EXAMINER

04/12/04